

REBUTTAL WITNESS DISCLOSURE OF WILLIAM G. HUGHSON, M.D., D. PHIL.

I submit this report, on behalf of W.R. Grace & Co., et al., in rebuttal to the expert reports of Dr. Henry A. Anderson, Dr. Samuel P. Hammar, Dr. Eugene J. Mark, Dr. Richard A. Lemen, Dr. Arthur L. Frank, Dr. Arnold R. Brody, and Dr. Laura S. Welch (collectively, "Claimants' Experts"). I have been provided with and have reviewed the Claimants' Experts' reports. In general, I disagree with their reports insofar as they are inconsistent with the opinions and views expressed in my report and insofar as they opine on matters not addressed in my report.

In addition, I am familiar with the medical articles upon which Claimants' Experts rely in support of their conclusions that exposure to asbestos-containing materials ("ACM") in-place in buildings places building occupants and maintenance workers at risk of developing asbestos-related disease, specifically mesothelioma. The articles on which Claimants' Experts rely, however, do not support the position held by Claimants' Experts. This is so, generally speaking, because: (1) the articles involve exposures at doses and in circumstances that are substantially different from the asbestos exposure that can reasonably be expected from ACM in-place in buildings; (2) the studies have confounding factors which make them irrelevant to exposure from ACM in-place in buildings; or (3) the articles are not epidemiological studies in that they reflect anecdotal medical evidence.

The medical articles on which Claimants' Experts rely can be separated into four broad categories: (1) environmental and community exposure; (2) household exposure; (3) building maintenance workers; and (4) anecdotal medical reports.

1. Environmental and Community Exposure

Claimants' Experts cite to several medical articles regarding environmental and community exposure to asbestos in support of their proposition that ACM in-place in buildings is associated with an increased risk of developing asbestos-related disease, specifically mesothelioma. These articles, however, involve such unusual exposure pathways and doses they do nothing to enlighten the issue of whether ACM in-place in buildings place an individual at risk for mesothelioma, or any other asbestos-related disease.

For example, Claimants' Experts rely on an article (Luo S, et al. Asbestos related diseases from environmental exposure to crocidolite in Da-yao, China. I. Review of exposure and epidemiological data. Occupational and Environmental Medicine 2003; 60(1):35-42) that reports on the incidence of asbestos-related disease among residents of the rural county of Da-yao, China. The researchers found that crocidolite asbestos fibers literally covered nearly 20% of the ground surfaces in the three Da-yao villages they studied. The soil, water supply and atmosphere in that region were all grossly contaminated with asbestos. Beyond that, there was occupational exposure to the crocidolite asbestos as a result of the villagers' commercial production of asbestos stoves and stove tubes using the crocidolite ore. In that work, crocidolite ore was crushed by machine in a semi-open air environment and also was crushed by hand. The villagers also used the crocidolite ore they had crushed as an ingredient in the paint and stucco they made and used for painting and plastering the walls in their homes.

The villagers of Da-yao used crocidolite asbestos for commercial purposes as well as common household purposes. They were exposed to crocidolite continuously, from cradle to grave, due to its presence in the atmosphere, soil and water supply. The asbestos exposure experienced by the Da-yao villagers is not at all comparable to the asbestos exposure of a

building occupant or maintenance worker from ACM in-place in buildings. In short, the environmental and community exposure studies upon which Claimants' Experts rely, of which the Luo article is but an example, say nothing on the issue of whether ACM in-place in building create a risk of asbestos-related disease for building occupants or maintenance workers.

2. Household Exposure

Claimants' Experts also rely on several articles which focus on the development of asbestos-related disease in individuals who were exposed to asbestos because they lived in the household of an asbestos worker. Two examples are Miller A. Mesothelioma in Household Members of Asbestos-Exposed Workers: 32 United States Cases Since 1990. *American Journal of Industrial Medicine* 2005, 47:458-462; and Schneider J, Straif K, Woitowitz HJ. Pleural Mesothelioma and Household Asbestos Exposure. *Review of Environmental Health* 1996, 11(1-2):65-70. Generally, the asbestos workers involved in these studies were reported not to have changed their clothes before leaving the work site and therefore asbestos dust entered the home on the workers' clothes and shoes, presumably on a daily basis. Family members were then exposed, principally while laundering the clothes. The articles indicate that lung fiber burdens in some household members who developed asbestos-related diseases were found to be as high as the levels found in the asbestos workers themselves. This indicates that the family members were exposed to high doses of asbestos fibers on a frequent, if not daily, basis. Thus, the exposure levels in these studies are not at all comparable to the exposure levels expected from ACM in-place in buildings, and therefore these articles are not relevant to the question of whether ACM in-place in buildings create a risk of asbestos-related disease for building occupants or maintenance workers.

3. Building Maintenance Workers

Among the articles relied on by Claimants' Experts are articles regarding custodians and other building maintenance workers, who presumably developed asbestos-related diseases from exposure to ACM in-place in buildings. The studies reflected in these articles, however, had many confounding factors which make them inapplicable here. For example, Levin reported on a series of 660 custodians of the New York City Board of Education. (Levin S, Selikoff I. Radiological Abnormalities and Asbestos Exposure Among Custodians of the New York City Board of Education. Ann. NY. Acad. Sci. 1991; 643:530-39). Of his 660 subjects, more than 400 had exposure to asbestos outside their employment as custodians, with more than 100 of them having asbestos exposure aboard ships while in the military. In addition, many of Levin's subjects reported working directly with ACM by removing or fixing such materials, work that is well known to be associated with high exposure levels. Included among Levin's group of "custodians" were boiler firemen who were responsible for maintaining and patching boiler equipment which contained asbestos. The high dose exposures reflected in the Levin article, and similar articles, do not support the proposition that building maintenance workers or occupants are at risk of developing asbestos-related diseases, specifically mesothelioma, from exposure to ACM in-place in buildings.


4. Anecdotal Medical Reports

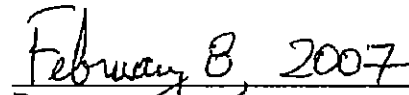
Anecdotal medical reports, in the form of case studies or case series, are not epidemiologically valid to provide causation and cannot be relied on for making associations between asbestos exposure and the development of asbestos-related disease. Anecdotal medical reports reflect a temporal relationship between exposure and a particular occurrence, but are

insufficient to prove medical causation. The articles upon which Claimants' Experts rely that reflect anecdotal medical reports offer no scientifically valid basis upon which to infer that maintenance workers or occupants in buildings with ACM are at any risk of asbestos-related disease. (Schneider J, Rödelberger K. et al. Environmental Exposure to Tremolite Asbestos: Pleural mesothelioma in Two Turkish Workers in Germany. Reviews on Environmental health 1998; 13(4): 213-220).

5. Conclusion

For the reasons summarized above, it is my opinion, to a reasonable degree of medical and scientific certainty, that the articles relied on by Claimants' Experts do not support the proposition that building occupants exposed to ACM in-place in buildings are at an increased risk of developing asbestos-related disease, specifically mesothelioma. Similarly, maintenance workers using appropriate operations and maintenance procedures to limit exposure would not be at risk of asbestos-related diseases.


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Date